

[REDACTED]  
PhD Candidate, Department of Civil and Environmental Engineering  
Massachusetts Institute of Technology  
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## Education

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**Massachusetts Institute of Technology** 2019 – 2025  
*PhD in Environmental Fluid Dynamics, GPA: 4.8/5* Cambridge, MA

Advisor: [REDACTED]

Relevant coursework:

- Advanced Fluid Mechanics (18.355)
- Advanced Instrumentation & Measurement (2.131)
- Nonlinear Dynamics & Turbulence (1.686)
- International Law of the Sea (HLS2958)
- Transport Processes in Environment (1.61)

**Institut Supérieur de l'Aéronautique et de l'Espace (ISAE)** 2018 – 2019  
*Master of Science in Advanced Fluid Dynamics, GPA: 3.91/4* [REDACTED]

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**Institut Supérieur de l'Aéronautique et de l'Espace (ISAE)** 2015 – 2019  
*Diploma in Aeronautics and Aerospace Engineering, GPA: 3.93/4* Toulouse, France

Engineering diploma in Aeronautics and Aerospace  
Major: Advanced Fluid Dynamics, Propulsion and Aeroacoustics.  
Minor: Energy, Transport and Environment.

Relevant coursework:

- Advanced Applied Mathematics
- Fluid Mechanics and Thermodynamics
- Instabilities, Transition and Turbulence
- Computational Fluid Dynamics

## Research Experience

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**Research Assistant | Environmental Dynamics Laboratory** 2020 – present  
*Department of Mechanical Engineering, MIT* Cambridge, MA

- Development of lab based set-up for full sediment characterization.
  - . Design of a combined PIV & Temperature controlled chamber for settling velocity measurement.
  - . Design and manufacturing of a Taylor-Couette cell for flow generation from fluid imposed shear stress.
- Development of ship-based protocols and set-up for sediment characterization.
  - . Development of a system for weighing at sea based on synchronization of two scales.
  - . Development of protocols for characterizing suspended sediment concentration through cross calibration of multiple turbidity meters.
- Development of the [REDACTED] particle characterizing instrument in collaboration with [REDACTED] grant from the US Department of Energy's ARPA-E.
  - . Lab based characterization of imaging system capabilities: calibration for resolution, Modulation transfer function (MTF), and depth of field.
  - . PIV based flow visualization for settling column design validation.
  - . Development of a fully automated particle detection and tracking velocimetry algorithm that outputs the size, morphological parameters, settling velocities and concentration of suspended particles.

**Visiting Student | Fluid Dynamics of Disease Transmission Laboratory** 2018 – 2019  
*Department of Civil and Environmental Engineering, MIT* Cambridge, MA

- Prediction of sheet evolution formed upon drop impacts on finite surfaces of complex geometries: incorporation of viscous stress effect on sheet energy balance.
- Development of a novel high resolution & high magnification high speed imaging system for direct imaging and direct measurements of boundary layer velocity profile.

## Research Assistant | Safran-AEGIS

2018 – 2019

Department of Aerodynamics Energetic & Propulsion, ISAE

Toulouse, France

- Derivation of generic hybrid architectures (series and parallel) containing a dual-energy (electric and fuel) propulsor.
- Derivation of a generic design model allowing for multiple potential configurations at a high-level with implicit coupled hybrid-electric propulsion system.
- Development of a novel methodology for conceptual design of hybrid-electric medium range aircraft to be used in the early stages of aircraft design to provide first order estimates of major sizing parameters.

## Research Assistant | Institut supérieur de l'aéronautique et de l'espace

2016 – 2017

Department of Aerodynamics Energetic & Propulsion, ISAE

Toulouse, France

- Review of state of the art aero-acoustic modelling of Counter-Rotating Open-Rotor (CROR).
- Implementation of a low-cost numerical approach to aircraft fan tonal noise modeling on MATLAB.
- Testing and verification of numerical convergence and robustness.
- Verification of consistency of key physical insights by changing key geometrical parameters.

## Visiting student | Samara State University International Summer Space School

2016 – 2017

Mission to Nanosatellite Design Summer program, Samara State University

Samara, Russia

- Analysis of the aerodynamic and aerothermodynamic spacecraft atmospheric re-entry.
- Conceptualization of thermal shields for CubeSat-like nanosatellites taking into account underlying physics of atmospheric re-entry.
- Estimation of the demise altitude for the nanosatellite and its on-board instrumentation.
- Design concept placed 2nd at the International Nanosatellite Design Competition amongst 29 entries.

## Presentations

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[REDACTED] Ocean Sciences Meeting, Division of Fluid Dynamics, February-March 2022.

[REDACTED] Annual Meeting of the American Physical Society, Division of Fluid Dynamics, November 2021, Phoenix, AZ.

[REDACTED] Annual Meeting of the American Physical Society, Division of Fluid Dynamics, November 2019, Seattle, WA.

[REDACTED] Fluids and Health Conference, July 2019, Corsica, France.

[REDACTED] Advanced Aircraft Efficiency in a Global Air Transport System' (AEGATS 18), October 2018, Toulouse, France.

## Teaching Experience

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Teaching Assistant | MIT, Civil and Environmental Engineering Department

- 1.631 Fluids and Diseases [REDACTED]: homework and exams grading, course project guidance from formulating proposals to finalizing results.

Communication Lab Fellow | MIT, Civil and Environmental Engineering Department

- Coaching for MIT students and postdocs on effective communication strategies: review of writing and presentation.
- Panel and workshop organization with other fellows for effective scientific writing and presentation.

Language Tutor | ISAE, The Languages, Arts, Cultures and Societies Department

- Introduction to navigating life in France and easing into communicating in French.
- Preparation courses for English proficiency tests for graduate applications.

## Fellowships and awards

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<b>School of Engineering MathWorks Fellowship</b>   <i>MathWorks &amp; MIT School of Engineering</i>	<b>2022 – 2023</b>
<b>SNAME Travel Support for OSM 2022</b>   <i>MIT Department of Mechanical Engineering</i>	<b>2022</b>
<b>CEE Communication Lab Fellowship</b>   <i>MIT Department of Civil and Environmental Engineering</i>	<b>2021 – 2023</b>
<b>Ippen Travel Support for APS-DFD 2021</b>   <i>MIT Department of Civil and Environmental Engineering</i>	<b>2021</b>
<b>School of Engineering MathWorks Fellowship</b>   <i>MathWorks &amp; MIT School of Engineering</i>	<b>2021 – 2022</b>
<b>Ippen Travel Support for APS-DFD 2019</b>   <i>MIT Department of Civil and Environmental Engineering</i>	<b>2019</b>
<b>Louis Berger Fellowship</b>   <i>The Louis Berger Group, Inc</i>	<b>2019 – 2020</b>
<b>MIT MISTI-France Seed Fund</b>   <i>MIT-MISTI</i>	<b>2018 – 2019</b>
<b>Major-Excellence Scholarship</b>   <i>Campus France Agency</i>	<b>2015 – 2018</b>
<b>Bourse Istihqaq</b>   <i>Mohammed VI Foundation</i>	<b>2013 – 2015</b>

## Technical Skills

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**Programming:** MATLAB, Simulink, Arduino, SolidWorks, Eclipse, Java, JavaFx, Fluent, StarCCM+, Basilisk, LaTeX  
**Experimentation skills:** Microscopic imaging, high speed imaging, image processing, mechanical design and fabrication (CNC, milling, lathing, 3D printing, laser cutting), electronics assembly.

## Languages

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**Arabic** (native)  
**French** (fluent)  
**English** (fluent)